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ORIGINAL ARTICLES.

A CASE OF CONGENITAL CORALLIFORM CATARACT OF BOTH EYES.

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My patient is a boy 10 years of age. His family history fails to throw any light on his eye disease. Neither of his grandparents, parents, uncles, aunts, cousins or sisters have an eye disease, they all have good sight, but one of his great-grand fathers is said to have been very near-sighted. His parents are not blood relations. The boy has never had a serious disease, he has always been thin and puny. He is four feet five and a half inches in height and weighs only 53 pounds. He has no signs of rachitis, unless a somewhat large head can be regarded as a sign of this disease. In its greatest circumference it measures 22 inches. His teeth present no marked abnormality. He has never had a convulsion, at least his mother who has been an almost ceaseless companion of the boy is sure he never had one. He has never seen any better than he does now and the cataracts were observed by his mother shortly after birth. His vision with dilated pupil is 6/60 with either eye. Glasses do not improve vision. Both eyes present the same picture. There is no impairment of the motility of the eyes. The external parts of the eyes are normal. The iris is blue and its texture is normal.

The pupil is active to light. The lens is in its normal position and after dilatation with a mydriatic presents the following appearance: The anterior capsule is transparent. Immediately behind it in its axis extending nearly through the entire thickness of the lens is an opaque core, not over a mm. in diameter, from which radiates throughout its whole length in all directions

opaque spokes ending in a trumpet-shaped enlargement, some much thicker than others. Between these opaque spokes are seen innumerable small glistening silvery points. None of the spokes reach the periphery of the lens or the anterior capsule, so that a zone about two mm. in width, with the pupil dilated ad maximum remains clear. The resemblance of this formation to the appearance of coral is so striking that a physician who had never heard of coralliform cataracts, to whom I showed the case, remarked at once, "Why he has a miniature coral formation in his lens." An ophthalmoscopic examination of the eyes could only be made with difficulty. The optic papilla was of normal appearance but had a slight conus on its temporal side.

The boy had been seen by an ophthalmologist five years before and the mother was advised by him, according to her statement, not to have anything done to the boy's eyes till he was at least ten years old.

On March 20, 1909, I needled the cataract of the left eye. The lens substance was very soft and some of it escaped through the opening of the capsule, immediately after the needling. This operation was not followed by any reaction, but six days after the needling the eye became painful. On examination I found some ciliary injection, the anterior chamber full of lens substance, and the iris seemed discolored. Ten. Five days after the needling I made an incision in the upper part of the cornea with a lance-shaped knife and evacuated the anterior chamber. A nearly black pupil resulted from the operation. For a few weeks opaque lens substance appeared in the pupil but all had been absorbed by July 10. On April 16, 1909, I needled the cataract of the right eye and found it of the same soft consistence as I had found in the left eye. Six days later the anterior chamber was nearly filled with lens matter which was evacuated through an incision in the upper part of the cornea. The lens matter removed was examined microscopically immediately after its removal and was found to contain very much cholesterin. At the present writing vision is in right eye with +1.5, D. 6/8; in the left eye with +1.5, D. 6/8. He reads best with +5. D. The ophthalmoscope shows normal eyeground, except a small ill-defined atrophic crescent on the temporal side of the optic papilla.

The very descriptive term, coralliform, for this form of cataract was first used by Mr. Marcus Gunn, who presented a case of this form of cataract to the Ophthalmoscopical Society of the United Kingdom, London, on March 14, 1895. A description of the

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case with an excellent illustration is found in the Transactions of this Society for 1895, p. 119. The picture is so much like that of my own case that I have reproduced it here.



By Knies the opacities have been compared to the sails of a windmill. Other cases have been reported by I. Herbert Fisher (Transactions of the Ophthalmoscopical Society of the United Kingdom, 1905, p. 90) and by Sydney Stephenson (loc. cit.) 1906, p. 72.

In both Gunn's and Fisher's cases there was a strong family tendency to cataracts. In the Royal London Ophthalmic Hospital Reports, Vol. XVI., p. 217, under the head of other varieties of Familial Congenital Cataract, E. Nettleship says: "Next to lamellar cataracts one of the best marked varieties is the peculiar and apparently rare form called *axial or spindle cataract* by the Germans or, to use Mr. Marcus Gunn's term, *coralliform cataract*, in which the opacity appears from the history to have been present quite early in life, if not actually at birth and remains like the lamellar form almost stationary, seldom becoming complete.

By far the best example of this sort that I have seen is that of the Betts family, in which no less than thirty persons in four generations are known to have been affected.

Probably some of the cases described by Knies, however, as spindle cataract and previously under a different title by E. Müller were of this kind. Knies, however, in some of his cases describes the character of axial and lamellar cataract associated in various degrees in the same lens. Two of the children in my case 58, had lamellar cataract, their father having coralliform opacity. Moreover, in cases of familial lamellar cataract atypical forms are occasionally seen. Although, therefore, it is necessary for descriptive purposes to keep the axial or coralliform apart from lamellar cataract, it may, perhaps, be found eventually that both arise from the same, or similar causes, operating at different stages or over longer or shorter periods of foetal life."

He describes the appearance of this cataract as follows: "The opacities take the form of dense blunt ended processes radiating obliquely forwards and outwards (i.e., towards equator) but not reaching the capsule. Each spoke or process ends peripherally in a sort of trumpet-shaped enlargement or 'mouth' not unlike the 'mouth' of a madreporal coral. Cholesterin is often present in coralliform cataract."

Referring to this form of cataract, E. Treacher Collins (*Transactions of the Section on Ophthalmology, American Medical Association, 1908, p. 476*) has this to say: "There is a variety of congenital axial cataracts termed by Gunn 'coralliform' for which it seems to me difficult to accept the explanation suggested by Knies for his case. In this coralliform cataract tube like opacities are seen to radiate forward and outward from the center of the lens toward the capsule and end in an ampulliform manner. In the absence of any histologic proof of the nature of such opacities, I would suggest that they are probably situated in the lines of suture between the fibers. What I now suggest is that disturbance in the lines of sutures not only at the surface but also in their course as they radiate forward and outward from the nucleus accounts for lines of opacity in congenital cataracts which are seen to radiate in that direction."

Hess (*Graefe-Saemisch Handbuch d. gesammten Augenheilkunde, 2te Auflage, 1905, II. Theil, VI. Band, LX. Kapitel, p. 159*), in speaking of the anatomy of spindle cataracts, says: "The conception of the typical form of spindle cataract, as the consequence of a disturbance in the segmentation of the lens vesicle, appears to me to be the most natural; anterior and posterior polar opacity, as well as its connection with a nuclear or lamellar cataract like opacity of the middle of the lens, offer no difficulties to this explanation. The close relations to lamellar cataracts, in which there are also often found anterior polar opacities, are evident from what has been said." Hess does not especially mention the coralliform cataract in the work above referred to.

A case very similar to the one here described was reported by Langenhans to the Berlin Ophthalmological Society March 18, 1909. (*Centralblatt f. Augenheilkunde, April, 1909, p. 111*). The patient was a boy four years old, with rickets.

My case therefore does not differ from those above cited except that heredity apparently played no part in causing the disease.

I have been unable to find a description of a similar case in American literature.

EXTRACTION OF CATARACT IN THE CAPSULE.

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When I was honored with an invitation to read a paper before this Congress I had little hesitation in selecting a subject; my only fear is that I might not be able to do adequate justice to it. It occurred to me that more interest would be aroused amongst us and more benefit derived in a method of surgical treatment that concerns itself with our every-day work in India, than if I had chosen some other subject which, though of special importance to ophthalmologists, would seldom fall under the personal care of a general surgeon. In India the treatment of cataract is of more importance than any other branch of surgery for it forms about one-third of the total selected surgical operations performed, and the number of extractions average about 20,000 annually. It is for this reason that I would ask your attention whilst I endeavor to place before you my experience and views on the Intracapsular Extraction of Cataract.

Since the main difference between this operation and the ordinary combined capsule-laceration is the treatment afforded to the capsule, the subject under discussion might aptly be called "The Battle of the Capsule," for the omission of one step, the opening of the capsule, constitutes the chief point over which various forces have been waging a scientific war for many years in the columns of *The Indian Medical Gazette*. The combatants so engaged, and who represent most of the leading eyemen in India, might suitably be divided into three parties: (a) those in favor; (b) those against, and (c) those who advocate Intra-Capsular Extraction in a few selected and suitable types of cataract. Before I proceed, it would not be amiss to state that in this important and practical operation it is unfair to either condemn or advocate it on a meagre experience, for during the first 50 or 100 extractions one is under training and has much to learn. The idiom *abusus non tollit usum* might well be applied here, for the pendulum of opinion which swings first in one particular direction and after a time in another, requires very careful watching; we should not be too much impressed with one swing and allow it to claim our entire attention lest in so doing we strain a point in its favor and utterly ignore the other swing. The

pendulum of the capsular clock has swayed in both directions, the intra-capsular and the capsule-laceration, and has done so ever since Pagenstecher first advocated extraction in the capsule as a routine measure. The intra-capsular swing was at the onset a very weak one, for it found favor with few ophthalmic surgeons, and extraction with laceration became recognized as the orthodox manner of treating cataract. It is only recently that Major H. Smith, I.M.S., of Jullundur, has revived it and given us the benefit of his unrivalled experience with the result, that to-day the ophthalmic world is looking to the East and watching with great interest the splendid work done by Smith. That this swing is now a strong one is evidenced from Smith's numerous followers not only in the Service, but also amongst the number of ophthalmic surgeons from Europe, America, and the colonies who have visited and are visiting Jullundur; in fact, speaking as a mofussil Civil Surgeon, it is often the topic of discussion when we meet; the question being, "What do you think of Smith's operation?" It has occurred to me and I feel sure you will agree, that a sufficient period has elapsed and that the time has arrived when we should come to some definite conclusions as to which is the better of these two operations. The time for such conjectural assumptions and expressions, based on "old established facts" and a meagre number of operations, as such-and-such a complication is "sure to happen"; "there is every likelihood of it happening"; "it is bound to happen;" "there is a dread of it happening," or "there is a deep-rooted aversion," &c., &c., has long passed; they are meaningless and unscientific, unless substantiated with accurate ophthalmological proofs, and cannot be accepted as determining factors in the settlement of this important subject. Something much more definite is not only needed in the interests of science, but is demanded from us by the younger generation of eyemen. I am conscious of the difficulties we in India labor under, as regards the ultimate results of our operations, we cannot follow up our cases years after extraction as is done by our more fortunate colleagues in Europe; but what we lose in this respect we gain in having more operative experience and are in a position to more or less look upon our first few hundred extractions as the initiary stage of our cataract experience. Up to now those in India who condemn extraction in the capsule have received little or no help from their European colleagues, who are in a better position to bring forward carefully compiled statistics, showing exactly how for certain complica-

tions, such as vitreous escape, or retinal detachment, militate against the final result of this operation; in fact, judging from the absence of any mention of extraction in the capsule in some of the recent text books, it would appear as if such an operation did not *exist*. It is for this reason I assert that the "fall" or "stand" of extraction in the capsule, which is admittedly the more brilliant of the two, depends and "*must*" be judged on practical results, and by this I mean, results obtained in the same manner as is applied to the capsulotomy operation. As an illustration let me take vitreous escape:—The capsule-laceration advocates contend that the evil consequences arising from such a complication are, as a rule, not immediate but remote and take months or years to develop. This is based almost entirely on experience and "old established dread" of European surgeons, who are better qualified to express an exact opinion, being able to follow up their cases. This being so, and considering the great revival which extraction in the capsule has recently exhibited, why, I ask, has no one come forward with a recent extensive series of such cases? There has been no lack of time and material for this to have been done. Possibly they experience some of the difficulties that we labor under; in any case, are we not justified, judging from the enormous literature bearing on this point, in accusing impaction in the incision of capsular tags and retained lens cortex as the causes of remote deterioration of vision following a capsule-laceration extraction? Might not the same analogy be drawn in the development of an abdominal hernia, years after a laparotomy has been performed, and in connecting the one as the result of the other, adduce it as a drawback to the original operation? If we are to judge, much as this is desirable, the merits or demerits of every surgical operation years after its performance, more especially cataract which is a senile change and distinctly a disease of the aged, there would be very few, and in this category I include capsule-laceration, that would stand the test and come out of the scrutiny with credit, when compared with immediate results. Although I give in to none in respect and gratitude to my old teachers, yet if I am correct in interpreting their apparent silent attitude on extraction in the capsule to mean that they would, rather, we fought this vexed question out amongst ourselves in India, the home of the cataract, the same as was done with litholopaxy, than, I maintain with Smith, that we should unhesitatingly subject all "old established facts and dreads," which have already enjoyed

too long an analytical immunity, and new ones, too, to a more recent and up-to-date rigorous scrutiny—one which modern science and riper experience demand. Some of these were facts at one time when the manipulative dexterity of cataract extraction was confined to a few, and when conjunctival asepsis was in its infancy and barely appreciated, but in common with all other branches of surgery, times have changed, ideas have altered, operative technique is now perfect and widely possessed, and conjunctival asepsis, though not perfect, is almost so. Viewed and judged in this light, I am so certain of the way in which the tide of opinion will flow, that I feel justified in prognosticating a marked revival of extraction in the capsule, and although its superiority over capsule-laceration, which Smith compares to that of litholopaxy over lithotomy has been jeered at, yet I say the day is not far distant when it will be recognized, not as an exaggeration or arrogance on his part, but more than the truth, and that the splendid work done by Smith will more than entitle his name to be enrolled in such distinguished company as Freyer and Keegan.

Before enumerating and discussing the advantages and disadvantages, I would like it to be distinctly understood that I do not consider extraction in the capsule a panacea for all forms of cataract; there are limitations to its application, and in these cases I am equally strong in advocating the capsule-laceration operation. I hold that it is contra-indicated in congenital, and the cataracts of adolescents; when there is plus tension; in the semi-gelatinous variety of senile cataract, when the cornea is abnormally small; when there are posterior synechiæ which refuse to break down under moderate pressure; and in some "very" rare cases of abnormally large lenses.

In discussing this subject I find it convenient to divide operators into two distinct schools: (a) the "Intra-capsular," (b) the "Capsule-laceration." These schools are peculiarly divided in India, viz., the "Intra-capsular" led by Major Smith, includes besides Birdwood, Oxley and myself many other eye surgeons whose experience will be welcomed at this Congress. The Capsule-laceration School is led at present by two Presidency eye surgeons, Col. Maynard and Major Elliott; also Col. Herbert.

The Intra-capsular School.—The advantages claimed are: (1) A cataract can be extracted at any stage of maturity; (2) its superiority over all other operative procedures in the extraction of immature cataract; (3) unless the capsule bursts, which it

seldom does, especially if a selection be made, the entire lens in its capsule is extracted; (4) the comparative marked absence of iritis as an after complication; (5) the absence of need for a secondary decision operation; (6) absence of the train of post-operative inflammatory symptoms so closely connected with and mainly caused by retained cortex; (7) absence of impaction in the incision of capsular tags, and its adhesion to the iris, with its subsequent dangers; (8) fewer instruments are introduced, thereby reducing the chances of infection, and the ill effects of over-free instrumentation; (9) convalescence is markedly shortened; (10) increased degree of visual acuity with a higher percentage of good vision, i.e., between 6/6 and 6/36, more especially 6/6 results; (11) atropine is unnecessary in the after treatment; (12) lower percentage of striped keratitis; (13) it is in all respects an infinitely superior operation.

The Capsule-laceration School.—The following are the disadvantages they bring forward against extraction in the capsule, viz.:

(1) Frequent loss of vitreous with its immediate and ultimate dangers, e.g., (a) Impairment of vision, (b) Infective inflammations, (c) Retinal detachment, (d) Hæmorrhage, (e) Delayed union, (f) Prolonged lowering of tension, (g) Distorted pupil.

(2) That by so frequently rupturing the supporting diaphragm, consisting of the suspensory ligament, the posterior parts of the lens capsule, and the hyaloid membrane, which acts as a guard against the inroad of infection and a safeguard to the anatomical equilibrium of the eye, *ipso-facto* surrender the integrity of the organ.

(3) The operation violates the essential conservatism of correct surgery, inasmuch that it introduces an unnecessary risk, for the sake of advantages which can be otherwise more safely and equally obtained.

(4) Frequent rupture of the capsule with its bad effect on vision.

(5) Incarceration and prolapse of iris.

(6) Haziness of the cornea.

(7) The necessity of unjustifiable pressure to extract the lens in the capsule with its dangers.

(8) Prolonged irritability, redness, lacrimation, and chemosis.

(9) Higher degree of post-operative astigmatism.

(10) It is not an operation to be recommended for beginners.

(11) The difficulty in attending to the toilet of the incision, lest the hyaloid be ruptured, and of its impossibility when vitreous has escaped.

(12) That what is gained on the one hand, by extracting in the capsule, is probably more than lost on the other hand, by the increased frequency of vitreous escape with all its dangers. These points might well be considered under groups (a) the important and (b) the unimportant. I shall confine myself to the former and discuss each in turn.

Advantages.—Its suitability for immature cataract is being widely recognized even by capsule-laceration operators. Maynard page 107 "Manual of Ophthalmic Operations," now admits this. I would refer you to a recent paper on this subject read by Smith before the American Ophthalmic Congress, and to one I have submitted to be read, next April, at the Naples International Ophthalmological Congress, in which I have dealt exhaustively with the matter. Briefly, its superiority over artificial maturation, is the danger and uncertainty of the latter procedure, and extraction with capsulotomy is not only very unsatisfactory, owing to its many complications, but incomplete on account of the intractable variety of after cataract which invariably results. As Maynard says, "The risks of expression are worth running to avoid such complications," or as Smith so correctly sums it up, "Ripening procedures are either dangerous or disappointing and the surgeon would be better advised to either wait on Nature's ripening process, or extract immature cataract in the capsule," and I agree with them. My own experience of over one hundred such extractions, has convinced me that it is the "ideal" operation; the capsule rarely bursts, being as it were stronger, and very slight pressure is necessary for extraction. The results obtained, and worked out on Jessop's classification, are given in table A.

TABLE A.

Variety of operation.	Vitreous escape %	Capsule burst.	Capsule left behind.	Septic infection.	Iritis.	Visual results.		
						Success	Partial success	Failures.
Extraction in capsule (Immature cataracts)	6	5	3	3	91	8	1

Bursting of the capsule.—It is unquestionable that when a cataract is extracted in its entire capsule no better result can be obtained; there is no need for further anxiety on the part of the

surgeon or patient, regarding a subsequent discission, which is not uncommonly required after a capsule-laceration. This is one of its most conspicuous advantages. Given a normal healing, unaccompanied with sequelæ, the result is as near perfect as is possible, and can be but rarely approached by the capsule-laceration operation; in fact 6/6 vision or very nearly so, is practically assured.

Rupture of the capsule varies in frequency from 5 to 17 per cent. according to the experience and skill of the operator. It can be markedly reduced by a proper selection of cases, execution of a large sized incision, avoidance of haste; and manipulative gentleness and care. It is least likely to happen with immature and hypermature cataracts, and more frequently in a large sized lens with a small cornea; congenital, and cataract of adolescents, and semi-gelatinous or blue colored variety of senile cataract, and when there are posterior synechiæ.

When it bursts, the worst that often happens, is a conversion into an ordinary capsule-laceration operation, but it even now claims advantage of its own, because as this accident mostly occurs when the lens appears at the point of coming out, it can, in at least half of the cases, be extracted in its entirety, by dissecting forceps, and the result is as good as if it had not ruptured. If we fail to extract the capsule the consequences are likely to be serious, for it is now in places loosened from its attachment to the suspensory ligament, and being but imperfectly opened as compared with a well executed capsulotomy, the greater part of it together with a varying amount of cortical debris is left in the eye, forming an intractable variety of after-cataract. This disadvantage is neither minimized nor denied by us, but on the other hand one must remember the numerous cases in which the capsule is extracted entire. I have performed a discission on eleven of my cases, with a visual improvement in ten. I have at times observed that the upper part of the capsule tends to be displaced backwards towards the vitreous, showing a small clear area above it, a discission in the cases is likely to produce vitreous opacities, owing to its free admixture with lens cortex; this happened in one of my cases. A more serious condition is when, with a ruptured capsule, there is an escape of vitreous, resulting at times in poor vision. Our opponents make the most of this complication, but I would point out that a similar condition is produced in a capsulotomy operation accompanied with a vitreous escape; and what holds true for one must be the same for the other; on

closer investigation it will be found, that with experienced operators, this drawback is almost equally common to both operations; take Smith's capsule bursting as 8 per cent. with capsule left behind in 4 per cent. and even if vitreous escaped in each of these 4 per cent. cases, we have a condition which is no worse than what happened in a capsulotomy operation, where the average vitreous escapes is 4 per cent.

Iritis.—That iritis is markedly absent after this operation few will deny; this must be so because the chief cause of this complication is got rid of, viz., "cortex." This is admitted by some of our opponents and though they make "little" of it, they are very decided in their opinions as to the part played by cortex. On the other hand Elliott holds a different view, and draws a marked distinction between "*irritation*" of the iris, which is commonly observed after a laceration extraction, and "*iritis*" which is uncommon; the latter he considers to be a pathological condition. He holds that the connection between the retention of cortex and iritis does not exist to the extent that we believe it to be. To obtain a clear understanding on this point it is desirable to take a review of what both schools say. Pagenstecher considered the prevention of iritis as one of the greatest advantages of intra-capsular extraction and this is more than corroborated by Smith who reports two cases in 2,494 extractions in unbroken capsule, whereas, during the same period he had 5 per cent. in 263 extractions in which the capsule either ruptured or was left behind. My own results, which include iritis of all grades of severity, are 3 per cent. in the intra-capsular, which mostly occurred when the capsule ruptured, and 14 per cent. in the laceration operation. If this is not conclusive evidence of cortical debris as the cause of most cases of post-operative iritis, I should like to know what is. Macnamara says that, the more experience he has, the more convinced is he, that most of our failures are due to retention of lens debris and capsule. Herbert, in commenting on the absence of clear active pupils the day after laceration extractions, holds that the exudations he observed, were mainly due to irritation from particles of lens substance left behind, and this he says is proved by the almost sure absence of iritis, after extraction in the capsule, and the capsulotomy extraction of Morgagnian cataracts; he also attributes his exemption from occluded pupils, not so much to guarding the wound from infection, as to a vigorous after treatment of mercury and atropine. Maynard, in admitting the comparative absence of iritis in intra-capsular extraction,

says, that a slight degree of iritis is fairly common after a capsulotomy operation and that retained capsule and cortex are liable to set up iritis by irritation apparently. Smith says that iritis does not follow when the lens is extracted in its capsule, and when present, is due to retained lens matter and capsule; he draws no distinction between "irritation" of the iris and "iritis," but calls them both iritis, and I agree with him. Elliott, on the other hand, in drawing a distinction between irritation of the iris and iritis, holds, that most of the cases which we call iritis, and which he says are characterized with a plastic exudate, are no more to be considered as inflammatory in nature than the aseptic healing of any wound by first intention. The determining factor, he says, is sepsis, and in its absence, we are unjustified in calling the condition an inflammation, clinically speaking. Although he admits that to leave cortex is undesirable, yet he holds that it is incorrect to throw on it the whole responsibility of post-operative iritis. Now, if retained cortical matter is not the cause of iritis, or let me call it irritation of the iris with a plastic exudate, and if it is merely the result of the traumatism inflicted on the iris by the iridectomy and which is performed in both operations, why is this exudate absent in an intra-capsular extraction, why is it not found after the performance of an optical iridectomy, and why is it more frequent in intra-capsular extractions when the capsule ruptures? I maintain that this is overwhelming evidence that the main cause is retained lens matter. The capsulotomy operators may say what they like of the benignness of most cases of simple iritis when properly treated, and in so doing, attempt to minimize its task; they may divide post-operative iritis into as many varieties as they choose, such as irritation of the iris, non-infective iritis, infective iritis, &c., but they cannot get over the fact that the practical difference between a mild attack of what they call "plastic iritis" and a well marked case of iridocyclitis or panophthalmitis is only a question of degree in the one, and an additional entrance of septic organisms in the other; that it is but a step from those exudates classed as non-inflammatory, to those mainly lymphoid in character, and yet another step from this is to complete occlusion of the pupil with a discolored atrophic iris, indicating total posterior synechia, and a gluing together of all the structures in which the vitreous is sure to participate and vision is reduced to moving objects only. Although the part played by sepsis cannot be denied in the severer forms of iritis, yet do not these grades of severity form the links of a chain of

post-operative inflammations, each so closely connected with the other, that we can never be sure where they begin, or where they will end? I do not assert that all, or many cases of iritis end disastrously, but I do most strongly maintain that, whereas by extracting in the capsule we practically eliminate iritis, we more or less invite and court its appearance and development in the capsule-laceration operation, for I have little doubt that most of the muddy pupils and exudates so frequently observed 24 hours after its performance are mainly due to the baneful and irritating action of lens debris; in fact we supply a pabulum for the entrance and propagation of both pathogenic and non-pathogenic organisms; add to this the additional strain thrown upon the absorptive powers of the eye and we have a condition which further handicaps the tissues of the organ in their struggle with micro-organisms. They may make "little" of this complication, as one easily counteracted by atropine and mercury, followed if necessary in ten or twelve days with a discission operation, which they say, if properly safeguarded, is devoid of risk, but this surely stands as a confession of a weak spot in the operation; moreover, what does the patient think of this even temporary impaired vision, with its discomforts, shattered hopes, prolonged medication and stay in hospital? I ask, what is there to commend itself in an operation, characterized in the majority of cases with a plastic exudate, which if not speedily treated, is likely to develop troublesome symptoms, and if these are averted, there can be no two opinions that convalescence is retarded, and is not always uneventful, that the adhesions formed result in a pupil possessed of a limited degree of activity. Why talk of one as an irritation of the iris and the other as iritis due to sepsis? Iritis can be produced by irritation, trauma, septic infection, and other causes. Why count the percentage of iritis only on those cases which develop iridocyclitis and other severe grades of inflammatory reactions which are, practically speaking, the final results of untreated exudates? All grades should be included. Why not, in the face of such strong evidence, give the credit of this advantage to the intra-capsular operation and admit that it constitutes a bugbear of the first magnitude in capsule laceration? In any case the fact still remains that the operation which eliminates iritis from its list of complications, however benign it may be, is "undoubtedly" the more superior one.

The absence of need for a secondary discission operation.—
That this is another of its conspicuous advantages, not even its

most adverse critics will deny, for the entire capsule is got rid of "*once and for ever.*" In a small percentage of cases, when the capsule ruptures and is left behind, does the necessity for a dissection arise. This gain is so obvious that the only further exposition it needs is to refute what the capsule-laceration operators say in its disfavor; viz., that it is obtained at too great a risk; that one is playing for high stakes and that it violates the essential conservatism of correct surgery inasmuch that it introduces an unnecessary risk for the sake of advantages, which can otherwise be more safely and equally obtained, viz., by a subsequent dissection. In deciding this, the following points requiring consideration naturally arise: (1) Are the risks we run high, or have they been magnified by our opponents? (2) If high, are they more than compensated by the distinct advantages gained? (3) Can the capsulotomy operation, even after a dissection has been performed, claim equal advantages? (4) Is a dissection operation practically free from risks? (5) If not are the advantages gained compensatory enough?

As far as extraction in the capsule is concerned these cannot be answered on the strength of a meagre number of operations. Manipulative dexterity and experience play an important role, for the more cataracts you extract, the less frequently does the vitreous escape, and the capsule burst. I shall not go so far as to assert that whether a capsule is opaque or not before operation, it is always opaque after operation; this would not be consistent with clinical facts, but we can never be sure of its transparency. Herbert says that with ordinary extraction, followed if necessary by needling, quite as good results can be obtained, and with much less risks, and at the cost of merely a little more troublesome and protracted after treatment. Elliott (I. M. G., May, 1906) did 75 dissections in 810 extractions with no bad results. He waits a month after extraction and atropises the eyes for another ten days, this means a stay in hospital for over a month, an example of patience which is rare to find imitated in other parts of India. In India, where most of our patients are uneducated, 10 per cent. of extractions would more than represent the dissections performed, whereas, in Europe it is more frequently resorted to, and in America, Knapp always operates on a cataract with a view to subsequent needling being necessary. The frequency of its performance also depends on the manner in which the capsulotomy has been executed and the anterior chamber cleared of lenticular debris. That this need does frequently

arise is evident from the numerous ways in which we are advised to do the capsulotomy, and the discission operation itself the object being to get rid of as much interior capsule as is possible, but no importance is attached to the posterior part of the capsule (which is said to be nearly always transparent), as being likely to lower vision, except to ascribe to it the quasi-important function of a supporting diaphragm. Recently, extraction of the anterior capsule by means of special capsular forceps has been strongly advocated and Treacher Collins gives a series of 100 extractions so treated, in which only 4 cases required subsequent needling; this is about the best that has been obtained, but, I would add, not without risk. Imitation, we know, is the sincerest form of flattery, and in comparing these various capsulotomy procedures, each so satisfactory to its respective advocate, with extraction in the entire capsule, we have an attempt at imitation; the attempt, however, is only half-hearted, because, although they admit that the retention of the anterior capsule is a disadvantage, and do their best to extract as much of it as they can; they do not extract the posterior part of the capsule lest vitreous escapes, and the integrity of the eye be surrendered, yet they think nothing of pushing this very structure together with adherent lens matter into the clear vitreous when doing a discission operation. They say that when properly safe-guarded a discission is free from risk; let me agree that it is "*practically*" free. I use the word "*practically*," guardedly, for we are not working in a sterile field, can never be sure that the eye is bacteria free until the test of an operation has been applied, and the result has pronounced the verdict. Certainties in theory are not always so in practice, or to use a sporting phrase "many horses are beaten when they ought to have won." That this small operation is at times a dangerous one is abundantly proved. Devereaux-Marshall reports 512 discissions with 1.02 per cent. suppurations, and 5.58 per cent. inflammatory changes resulting in total loss of sight. Trousseau gives 19 discissions, with panophthalmitis 1, iritis 4, cyclitis 1, and irido-choroiditis 1; De-Gama-Pinto in 198 discissions, reports 9 vitreous incarcerations, and 4 suppurations. Panas says that cyclitis, vitreous opacities, glaucoma, and retinal detachment are not infrequent after discission. These are carefully compiled opinions of some of the masters of Europe and with this array of evidence, I ask, is a discission operation practically without risk even using the word "*practically*" in its most liberal form? And willingly as I admit that by its performance

vision is improved, yet are the advantages gained commensurate, or equal to those aimed at and obtained by extracting in the capsule? Is the jeopardizing of an eye to infection for a second time, devoid of risk? And to quote them, is vitreous escape or incarceration detachment of the retina, glaucoma, destructive irido-cyclitis, practically devoid of risk? On the contrary I unhesitatingly assert that it is pregnant with danger, both immediate and remote; for can any surgeon say that when he needles an after-cataract, the instrument penetrates the capsule and "it" only that he does not churn up the vitreous in a varying degree, that he does not court a mixing up of clear vitreous with lens capsule and inflammatory lenticular debris, and is such a procedure to be considered as practically devoid of risk? He will be a bold surgeon who can say this with equanimity. We might well turn the tables and ask the capsule-laceration advocates if they are not striving for an advantage at too great a risk, and playing for high stakes, and have they followed up their discissions for years afterwards, as we are asked to do with our escapes, to prove that the operation is also devoid of "remote" risks? I would go further and state, that the risks they run are higher on account of the possible rekindling of old inflammatory mischief. It is for this reason I maintain, that the necessity of a secondary discission stamps the capsule-laceration operation not only as an imperfect one, but as infinitely inferior to extraction in the capsule. The object of both these operations, is to restore sight; in one, the capsule laceration, this is accomplished with extracting the lens, and is frequently followed by iritis and secondary cataract, or in other words: to cure one disease, you at times produce another, which requires vigorous after-treatment of atropine and mercury, and yet another, which requires a subsequent needling or some other surgical interference; whereas in the other operation, intra-capsular, sight is restored with one operation only. I would not be far wrong if I compared these two operations for cataract to the treatment of a cyst; one in which the sac is left behind to refill (discission) or to slowly heal by granulations (post-operative iritis), and the other in which the entire sac is removed and healing occurs by first intention (intra-capsular).

Absence of capsular impaction in the incision.—That (except in a few cases when the capsule bursts and is left behind) the absence of these tags in the incision must be considered as another of its advantages, is evident from the very operation itself. It must be equally apparent that there is a constant dread of this

happening after a capsulotomy operation, as evidenced by the various ways we are advised to cleanse the edges of the incision. It is admittedly a drawback of the operation, for besides being an omnipresent drain for infection, it retards healing, and is said to be the chief cause in the development of post-operative glaucoma; and any frequency of this last complication is denied by many capsule-laceration operators, although Herbert attributes his comparative freedom from it, to the formation of a filtrating cicatrix under the conjunctival flap which he always cuts out. An attack of glaucoma is also likely to develop some time after extraction has been performed; it is, therefore, not only an immediate but a remote complication. Capsule-laceration operators refuse to contract these late developments of glaucoma with any fault of the operation. I have no statistics with me, but is not this connection just as legitimate an one as that made by them, between vitreous escape and a late detachment of the retina in the intra-capsular operation, and are they in possession of carefully compiled statistics to prove that this is not so?

Fewer instruments.—There is no doubt that for overfree instrumentation one has often to pay a penalty. Especially is this so in cataract extraction where it is seldom if ever needed. In extracting in the capsule, besides the knife, only one other instrument, the iris forceps, is introduced into the eye and as the piece of iris caught is excised, it practically amounts to one instrument. This must, although only in a minor way, reduce the chances of septic infection, and should be reckoned as an advantage. In this connection I would point out that the irrigator is not needed, as it is in a capsulotomy operation, from which it is inseparable. I have no desire to minimize the many advantages obtained by intra-ocular irrigation; it is safe enough in a fully staffed and equipped hospital, but my meagre experience has taught me to look upon it with respect and suspicion, *vide* I. M. G. Vol. XLIII. (1907) page 450 Col. Herbert, on page 241 "Cataract Extraction," very correctly sums up the infective risks attending intra-ocular irrigation which he says are "real" though small, and not of the gravest.

Convalescence.—This is considerably shortened in the intra-capsular operation, the patient being able to leave the hospital on the 7th or 8th day; there is no need for a prolonged detention to treat those benign yet troublesome grades of inflammations or needling operations, so common to the capsule laceration extraction. This gain counts for much in India.

Visual results.—To prove that not only is there a higher percentage of good vision but also more acute vision, I have given a series of results of both operations as obtained by different surgeons:

TABLE B.

Operator.	Variety of operation.	Nos. operated on.	Successes.	Partial successes.	Failures.
Smith	Intra-capsular.	2,616	99.27	0.38	9.34
Herbert	Capsule laceration	1,262	92.1	6.2	1.7

Table B refers to Smith's intra-capsular and Herbert's capsule-laceration results.

Table C refers to 100 cases of double cataract (200 extractions) done by me in which one eye was operated on by the intra-capsular method and the other with a capsulotomy. I did not pick, or choose my cases as to their suitability to one or the other operation, except that all immature cataracts were extracted in the capsule, and the capsule was lacerated when there was evidence of increased tension (this was present in 6 eyes). In this series I varied my incision to prove my belief that there is a definite connection between the position of the incision and vitreous escape. Full details will be obtained in an early publication of the B. M. Journal. These tables speak for themselves; they prove most conclusively that vision is more acute. My results are worked out on Jessop's classification, that is, a "success" when with glasses vision is at least 61.36. "Partial success" when vision is less than 61.60, and at least large objects. Failures when there is perception of light only.

TABLE C.

Variety of operation.	Nos. operated on.	Visual results.								Below % ₆₀ and counting fingers	Vision lost.
		% ₆₀	% ₄₈	% ₃₆	% ₂₄	% ₁₈	% ₁₂	% ₉	% ₆		
Intracapsular.	100	27	13	13	16	15	6	4	5	1	
Capsule laceration.	100	4	3	11	20	18	19	13	10	2	(Includes once panophthalmitis due to lacrymal disease).

DISADVANTAGES.

Frequent loss of vitreous.—The frequency of this complication is pointed out as the "chief" drawback of extracting in the capsule, and to this are attributed the immediate and remote conse-

quences I have already enumerated. Before discussing them I shall first refer to the frequency of escapes in both operations. In intra-capsular, the percentage varies from 6 to 38 per cent., being dependent on many factors, e.g., behavior of the patient during and after extraction, size and position of the incision, being more frequent the nearer it approaches the sclera and *vice versa*; skill and experience of the operator and assistants, especially for left eye extractions; proper selection of cases; avoidance of haste and excessive pressure; inhibition of the orbicularis and other extrinsic ocular muscles, indiscriminate use of the speculum, etc., etc. Smith had 6.8 per cent. in 2,616 extractions and has since reduced this. Birdwood 35 per cent. in 311. Maynard 38.28 per cent. in 175. Oxley 35 per cent. in 80. Knapp had 13 escapes in 104. Drake-Brockman (doing Pagenstecher's operation) 28.67 per cent. in 293. My own results work out at 10.50 per cent. in 811 without selection, less with selection, and 6 per cent. in immature cataracts. Smith tells me that some of his recent visitors have done 3 to 400 extractions with a little over 5 per cent. escapes. Against this, in the capsulotomy operation, Elliot gives 27 per cent., Maynard 4.3 per cent., Herbert 3 per cent., and my own 3.75 per cent. Glancing at these figures it is apparent that the escapes "*are*" more frequent in intra-capsular extraction. In my first 100 operations I had 22 per cent. escapes, which shows that it improves with experience. I have performed over 800 extractions in the capsule and excepting 9, the other escapes were very small. In this connection I would like to point out to our opponents that the percentages they give do not correctly represent all their escapes, for they do not include those discission operations in which vitreous is incarcerated or hangs out from the needle puncture; this would slightly increase their numbers, especially if discission was performed as frequently as it should be done; moreover, no mention is made of the numerous instances, after a discission, when the vitreous is displaced and occupies the anterior chamber, and differs from an ordinary escape only inasmuch that it is likely to raise and not lower tension, for the other evil effects are, practically speaking, common to both varieties of escapes.

I shall now take up each of the evil results attributable to an escape:

Impairment of Vision.—As it would not be fair to take any one individual operator's result to prove that vision is *not* impaired, I have collected, as well as I can, the results of various

surgeons and represented them together in Table D. There may be minor errors here and there, but I am dealing with these results collectively. In this table I have not included Oxley's last 40 extractions in the capsule, with 40 per cent. vitreous escapes, successes 95 per cent., failure 5 per cent. Birdwood's 311 intra-capsular cases with 47 to 35 per cent. vitreous escapes, successes 90.9 per cent., and 849 laceration extractions with 91 per cent., successes are also not included, as he does not classify his visual results. I would also point out that Drake-Brockman performed Pagenstecher's operation.

TABLE D.

Operator.	No. of cases.	Vitreous escape %	Vitreous escapes (Approximate total)	Successes.	Partial successes.	Failures
		Intra-capsular				
Smith	2616	6.8	176	99.27	0.38	0.34
Drake-Brockman (Pagenstecher's operation.)	293	28.67	83	66.21	28.32	5.46
Maynard	176	38.28	51	92.5	5	2.5
Gidney	811	10.50	94	90.5	8.25	1.75
Totals (average).	3896	21.31	404	87.12	10.49	2.51
		Capsule laceration				
Herbert	1262	3	38	92.1	6.2	1.7
Elliott (I. M. G., May, 1906).	200	2.7	5	89	9.5	1.5
Drake-Brockman.	293	5.80	15	65.18	28.65	6.81
Gidney (last series).	1000	3.75	40	82	15.75	2.25
Totals (average).	2755	3.81	98	82.07	15.02	3.06

On examining the totals of these two distinct series it will be observed that in 3,896 intra-capsular operations, with an average vitreous escape of 21.31 per cent. (i.e., 404 total escapes) the average visual results work out, successes 87.12 per cent., partial successes 90.0 per cent., and 849 laceration extractions with 91 capsulotomy extraction, with an average vitreous escape of 3.81 per cent. (i.e., 98 total escapes), you have successes 82.07 per cent., partial success 15.02 per cent., failures 3.06 per cent. This means that although the average percentage of vitreous escapes is about 7 times higher in the intra-capsular operation, yet the successes are better by 5 per cent., and the failures show a lower figure. The same differences are observed even if I exclude Smith's intra-capsular results, which stand in a class by themselves, and Herbert's capsule laceration results, in fact, the vitreous escapes are now 8 times higher. This surely does *not* prove that vision is impaired. Our opponents might say that these figures represent the immediate results only, and that a later examination would reveal poorer statistics, owing to the remote

evil consequences. Might we not say the same of other figures, especially when we remember the dire results which have followed discission operations, and the slow inflammatory troubles which are not unknown to this operation. Let them prove this; as far as my experience goes, and I have been able to follow up some of my large and small escapes for some time, with "very" few exceptions, have observed no deterioration in vision. Why should there be? When vitreous is lost, it is replaced with a clear fluid, secreted probably from the ciliary region, which not only restores tension and the support the retina is said to require, but allows rays of light to be transmitted; in other words, a functional vitreous, one which subserves optical functions is restored. An anatomical vitreous, alike in every respect to the original, is not vitally necessary for sight, for the frame-work and migratory cells have played their part, and are practically the final degenerative remains of the once primary embryonal connective tissue, and possess no optical functions.

Septic infection.—When vitreous escapes, septic infection, immediate or remote, is said to be more likely to occur. If this was so, surely sufficient time has elapsed for it to be proved beyond doubt. We cannot accept this on the strength of isolated cases, small series, and such remarks as "It is only fair to attribute to this source some of the infective inflammations which follow early or late. I have thought that after escape of vitreous in our practice infective losses were more frequent." These are expressions and impressions but not the facts which we ask for. Smith in 2,616 extractions had 9 copious escapes of which three were completely lost, he makes no mention of sepsis as the cause. In 2,494 of these cases he had 9 failures, all from sepsis, but does not mention if vitreous escaped. Oxley with 26 escapes, mentions no sepsis. Herbert (I.M.G., February, 1906) mentions no sepsis in a series of 22 escapes. Maynard had 2 infections in 67 escapes, but from the details he gives of his failures, the capsule burst in most of them. In my 94 escapes I had one infection. In Table D we have 405 escapes, with an average of 2.5 per cent. failures from all causes. Elliott reports 58 escapes in 2,000 laceration extractions with 2 cases of poor vision, one occluded pupil (probably due to retained lens cortex) and one hypopyon. L. M. Mukherjee, Transactions Indian Medical Congress, 1894, quoting from the Calcutta Oph. Hospital records, gives 28 failures in 122 escapes; 9 of these ended in atrophy of the eye and the others in septic infection. In this connection I would draw

attention to the period these cases represent, viz., on or before 1894, a time when conjunctival antisepsis was barely understood or appreciated. Moreover, it was at this very Congress that Bamber published 210 extractions free from sepsis; the very first series of good results published in India. I would also quote from the Madras Hospital record of 1897 when there were 75 septic infections in 1,161 ordinary extractions, to show that conjunctival asepsis was even then in its infancy. The age of these records renders them valueless. Let me view it in another way. Elliott recently reports 1,000 laceration extractions, his vitreous escape is 2.7 per cent., which makes a total of 27 escapes, yet he mentions no case of infection as being due to this. Herbert gives 1,872 laceration operations, his vitreous escape is 3 per cent., that is a total of 56 escapes, he also makes no similar mention of sepsis. This works out 83 escapes with no septic infection. Now, the prognostic importance of an escape is very different in the two operations, as far as sepsis is concerned; in the one, with a few exceptions, the lens in its capsule is extracted, and with an escape the worst that happens is, that the edges of the incision are bathed with vitreous, a structure whose histological elements are practically negative; in the other, with almost every escape, the capsule with lens cortex is left in the eye; moreover since the toilet of the incision cannot be attended to, there is an additional path for infection afforded, owing to the impaction of capsular tags. It is also recognized that the quantity lost has very little influence. The question now arises: If an escape does expose an eye to septic infection, after which operation is this more likely to develop? In an eye from which vitreous admittedly escapes more frequently, but is rid of all cortex and capsular impaction in the incision, or one in which the capsule and lens debris are left in the eye, with tags of capsule impacted? I think there will be very little doubt that it is more likely to develop in the capsule-laceration operation, and yet two of its well-known advocates have had no infection in 83 escapes. Surely this does not support them in their dread of septic infection. In this, I decline to include septic infection after a discission complicated with vitreous escape or incarceration, for in these cases, other causes are present, especially rekindling of an old inflammatory mischief. In a copious escape, with the eye emptied out, septic infection is conceivable, but such escapes are the exceptions. In this connection I might ask: For every single case of septic infection due to vitreous escape, how many are there, which can be traced to retain cortex? In my opinion this fear though

real, is very small and has been exaggerated. To be established it must be supported with a large series of cases more recent than 1894. Viewing the question with our present-day knowledge of conjunctival asepsis, I maintain that although an escape is an undesirable complication, yet even when moderate in quantity, the eye is not more prone to septic infection. This charge might have been more justly brought some years ago when it was common to all varieties of extraction. With septic organisms present, infection will take place, mild or virulent and irrespective of vitreous escape and the so-called supporting diaphragm, but with adequate precautions as we now take, sepsis will always be the exception. The chief problem which affects all surgical results is the exclusion of sepsis, and as far as ophthalmic operations are concerned, this largely depends on attention to details and the care used in the preparation of the operation field. Herbert struck a true note when he said, "Probably Smith's relative immunity from infective losses is attributable to his preliminary douching of the conjunctival with 1 in 2,000 perchloride."

Detachment of the Retina.—That this develops after an escape of vitreous in such frequency as to constitute a drawback in intracapsular extraction has yet to be established. If this was ophthalmologically proved it would undoubtedly be the death-blow to the operation. Its occasional development after an enormous escape, owing to a loss of support, is conceivable; but such escapes are rare and there are many large escapes showing no signs whatever of detachment. Smith says it is a rare development, so rare that he sees no function of the supporting diaphragm keeping it in its place, and his opinion is based on 17,000 extractions in the capsule. In my 94 escapes 9 were large. I have repeatedly been able to examine 19 of these cases and in none have I observed any signs of retinal detachment. Maynard and Elliott make no mention of it in their escapes. Herbert in commenting on 22 escapes of which 3 could see only moving objects says that "Two cases '*almost*' certainly had retinal detachment," and again in a foot-note, *possibly* all three had; there is nothing definite about this. Even admitting the connection between vitreous escape and retinal detachment, surely we should be supplied with more definite and exact knowledge than we now possess. It "*must*" be uncommon, otherwise how can this absence of evidence on the part of our opponents be explained. This cannot be due to either lack of material or time, for if I confined myself to the totals of Herbert, Maynard and Elliott, the three largest laceration opera-

tors in India, at say 5,000 extraction each; this would give a supply of 500 escapes, which is sufficient material; but I share with them in their difficulty in following up cases for any length of time. The European surgeons are, however, pointed out as the authorities; well, why have none of them come forward? They may on this point have a very decided dread of the after consequences of vitreous escape; so have all of us of pus from a pyo-salpinx or appendix entering the abdominal cavity; the latter is apparent and has been proved, but not so the former which is assumptive; surely their experience and facility of following up cases should give us more definite knowledge, especially is this now needed, considering the remarkable revival of extraction in the capsule not only in India, but in Europe and America. If a retinal detachment be due to loss of support, then it should be more commonly observed after intra-capsular operation; if due to the fixation of vitreous tissue to the corneal incision, discission puncture, or tags of the posterior capsule after this has been needled, it would develop more frequently after a capsule-laceration extraction followed with the discission, when the vitreous must to a varying extent be disturbed, enter the anterior chamber and adhere to the torn edges of the capsule; again if due to other causes unconnected with the operation, and this is not unlikely, it has to be proved. We are in possession of small series exhibiting retinal detachment after both operations, but for the settlement of such an important point we require more proof than a few recorded cases, and although we have no desire to minimize the consequences of very large escapes, yet until the proof is supplied we feel that we are more than justified to extract in the capsule, to believe that this fear of retinal detachment has been enormously exaggerated, and to ascribe to it a position of importance, much lower down in the list of cataract sequelæ, than the evil effects of retained lens debris and capsule.

Hæmorrhage.—That this occasionally happens is evident from the isolated cases reported from time to time. The only large series I can find in the literature at my disposal, is one given by Quackenboss of Boston, who reports three cases in 3,624 extractions: a proportion of 1 in 1,200. It is a rare complication, and considering that it occurs after both operations and irrespective of the loss of vitreous support, the cause appears to be some degenerative changes either in the choroid or choroidal vessels; if this was not so, it would be more frequently observed after vitreous escape. I have had experience of two such cases,

both women, one after a copious vitreous escape, and the other in 1905, after a capsule laceration operation with no escape. In both patients there was evidence of renal disease, which has led me to think that marked arterio-sclerosis is at times a contra-indication to contract extraction.

Delayed Union.—This disadvantage might have been mentioned years ago when conjunctival asepsis was not so thoroughly understood and appreciated as at the present day. In any case in intra-capsular extraction you rid the incision of the presence of capsular tags and this is a decided gain.

Prolonged Lowering of Tension.—In my intra-capsular extraction I have had little experience of this complication. I am better acquainted with it in my capsule-laceration work, when much of my time was devoted to treating not a few post-operative inflammations possessing all the symptoms of irido-cyclitis.

Distorted Pupil.—I confess that I have seen this follow extraction in the capsule, but in my opinion it has no certain connection with an escape of vitreous, for I have observed it when there was no such loss. Its mechanical action I am not prepared to discuss till I have microscopically examined a case. It is unsightly, but I would rather have a distorted black pupil with no capsule or exudate behind it, than one which is adherent to the capsule on its entire posterior surface, possessing a limited degree of mobility, and occupied at times, except when "efficiently" needled, with a structure varying in density from a thin web-like posterior capsule to a thick opaque film.

Toilet.—The difficulty, and at times the impossibility, of attending to the toilet of the incision is a weak point of both operations complicated with vitreous escape, but as previously remarked, you have no fear of capsular impaction when extracting in the capsule.

Supporting Diaphragm of the Eye.—If the posterior part of the capsule was possessed of any function after the extraction of the lens, its utility and value of retention, intact, might be seriously considered, but as the very structure for which it was developed and was in existence, has been taken out, and as one can never be sure that this part of the capsule will be found transparent till after the lens is extracted, and when, if opaque, it will require subsequent needling, I maintain that its retention has nothing to commend itself, except, taking another view, to lower vision and to add yet another to the already numerous operative procedures necessary after cataract extraction, and which in this

particular operation can be done in many ways, each supporting the other as an open confession of one of the weak spots of capsule laceration. In this connection I might ask our opponents, what happens to this supporting diaphragm when a discission is performed, does it still possess its function? No, this new function given to the posterior capsule is of mushroom growth, one of convenience and not of utility. Exclude sepsis and eschew such sentimentality.

Incarceration and Prolapse of Iris.—Smith does not mention this in his experience. Knapp reports 17 in 104 extractions, but as no iridectomy was performed, they are valueless. Maynard had 5 prolapses. Oxley and Birdwood mention that the iris is likely to be caught at the angles of the incision, and such was my experience at first. I have practically excluded this from my last 300 extractions; I attribute it to the use of eserine (Oxley) after every operation, and the situation of my incision, which I have called "Corneo-sclero-corneal" and which I consider to be the most suitable for intra-capsular extraction, for ending as it does 1 mm. below the upper periphery of the cornea, it offers a strong mechanical and anatomical bar not only to iris prolapse but vitreous escape.

Increased Astigmatism.—For this to be adduced as a serious objection, it must be proved with carefully compiled statistics, and until this is done we can afford to ignore it. In my experience using the incision which I recommend, and not disturbing the dressings till the fourth day unless called for, I find all my cases evenly healed and with no higher degree of post-operative astigmatism than after a capsule-laceration extraction. As other surgeons, who have recently started extracting in the capsule, are reading papers, I shall refrain from remarking on its suitability or otherwise for beginners except to say that this operation offered no terrors to me when I began.

Excessive Pressure.—If a proper selection be made the need for excessive pressure seldom arises. It appears to be more often resorted to in sunken eyes with abnormally small cornea, a condition in which extraction in the capsule is clearly contra-indicated. More pressure than is usual is at times needed to extract a lens complicated with posterior synechiæ; its chief necessity, however, is too small an incision. My practice is, if I find after moderate pressure that the lens has not started to move, I at once examine the incision, and if necessary enlarge it, and try again, using steady, uniform and slow pressure. If the lens still refuses to

move which is "very" rarely experienced, the case is evidently not suitable for intra-capsular extraction, and rather than wilfully court rupture of the capsule and a large escape of vitreous together with the results of prolonged instrumentation, I lacerate the capsule and extract in the ordinary manner. I have had to do this 7 times, but the need for it happened more frequently during my early cases. In these 7 cases I noticed that more cortex came out with the lens than is usually observed in such operations, possibly the prolonged pressure of the strabismus hook forced the soft cortex, and compressed it against the upper edge of the capsule.

I have entered into all the points brought forward by both schools and I leave it to you to decide if what is gained on the one hand by extracting in the capsule, is lost on the other hand; whether the dangers of the operation are real and have been established, or as Mark Twain said of the announcement of his own death "grossly exaggerated."

REVIEW.

THE OPHTHALMIC YEAR BOOK. By Edward Jackson, G. E. de Schweinitz and Th. B. Schneidemann. Vol VI. Illustrated. Denver, Colo. The Herrick Book & Stationery Co.

The admirable record which the previous volumes of the Year Book have made for themselves is well sustained in this one. As a frontispiece this volume presents a photograph of Snellen. After the preface, biographical notices are given of the oculists who have died during the year 1908.

The editorial staff has received a valuable addition in the person of Dr. Th. B. Schneidemann.

As it has become impossible for any one to read and digest all that is written concerning ophthalmology, a book like this in which the grain has been freed of chaff and which gives careful and correct abstracts of what is of importance in the year's ophthalmic literature, must be welcomed by every one. ALT.

MEDICAL SOCIETIES.

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Thursday, June 10th, at 8 p.m.

Mr. W. H. H. Jessop, Vice-President, in the Chair.

A Case Operated on for Paralytic Ptosis by His Method of Resection.—Dr. A. Freeland Fergus.

The patient, on whom this operation had been performed, was shown as an example of the method of procedure adopted by Dr. Freeland Fergus, and described by him in the last volume of the Transactions.

Dr. Eason pointed out that when the patient opened his eyes, which he did well, the occipito-frontalis did not appear to be acting, but the movement was carried out by the levator palpebrae.

Mr. A. H. Thompson also recalled the fact that the man had paralysis of several other ocular muscles at the time the case had been previously described, but that these had now recovered.

Spectroscope for Testing Hue Perception.—Dr. F. W. Edridge-Green.

A Case of Double Iridectomy for Congenital Glaucoma by the Method of Lagrange.—Mr. Arnold Lawson.

The patient, aged 34, was first seen in December, 1908. The sight in the left eye had always been weak; and lately that in the right, which up till now had been considered sound, had been getting much worse. R.V. 6/36 c.—4.5 sph.=6/18 (2); L.V. Fingers at 2 feet. Both eyes were larger than normal, had large corneae and deep anterior chambers. Pupils somewhat dilated and almost immobile, especially the left. T+2. Both discs were cupped; and the left field was reduced to a minute area about 2 degrees in diameter round the fixation point.

Having decided that an ordinary iridectomy would not be

appropriate treatment in this case, Mr. Lawson performed a Lagrange's operation on the left eye on December 14th, 1908. The tension gradually diminished and the vision with correction improved to 6/18 full. Eight weeks later the same operation was performed on the right eye.

Various opinions were expressed regarding the merits of Lagrange's operation. Dr. Weeks (of New York) said he had performed it 30 or 40 times, but the results had not been such as he had anticipated. By carrying out the method of Lagrange one was enabled to do a good iridectomy, healing of the wound was retarded and the late cicatrization was the result; but after three or four months the scar presented the appearance seen in an ordinary iridectomy. Dr. Weeks favored the formation of a filtering scar by means of inclusion of a piece of iris in the wound, were it not that the risks of the operation outweighed the advantages.

Mr. Treacher Collins opposed the operation of Lagrange on theoretical grounds, and considered that the operation of cyclo-dialysis, which attempted to open up the normal channels, was founded on better principles. Incarceration of iris involved the risk of possible infection at some future date.

Dr. Odillo Maher was in the habit of making a cystoid scar by deliberately arranging for the inclusion of a portion of iris in the wound; and had lost only one case up to the present from infection.

Mr. Richard Cross was on the whole in favor of forming a leaking scar.

An Unusual Form of Cataract, Bilateral, in a Girl.—Mr. J. Herbert Fisher.

A. M. S., female, aged 12, was first seen October, 1907. She was the third child of five and none of the others were affected.

The vision, with correction, was 5/12 partly in each eye.

Each lens showed a circular dot of opacity at the posterior pole, and radiating from this 6 cortical striae at symmetrical intervals. The whole appearance might be called a boat-shaped or elliptical opacity lying somewhat obliquely with its long axis approaching to the vertical; the free margin is sharply cut, and the cortical striae show open mouths and are strongly suggestive of the trumpet-shaped opacities seen in coralliform cataract, of which it may possibly be a variety.

Bilateral Ptosis and Ophthalmoplegia Externa.—Mr. W. H. H. Jessop.

Norah H., aged 5, was first seen April 28th, 1909. Photographs taken of the child in earlier life confirmed the history that the condition had only been noticed for six weeks. No history of any illness. On March 15th there was drooping of the right lid, followed by a squint on the 21st, and subsequently drooping of the left lid. The family history showed that the maternal grandfather died of phthisis, and two daughters died at 13 and 11 months respectively of wasting disease. Both eyes show complete paralysis of both levatores palpebræ, there is 5° of strabismus in the right and limitation of movement upwards, downwards, and inwards, while in the left the movements are defective upwards and outwards. von Pirquet's reaction gave a positive result. The case was being treated with tuberculin injections.

Dr. Batten considered that it was a case of tuberculosis affecting the corpora quadrigemina, extending backwards so as to involve the sixth and the seventh cranial nerve.

Mr. Jessop remarked that Dr. Ormerod had expressed the same view regarding the case.

Unilateral Swelling of the Eyelids, ? Tubercular.—Mr. W. M. Bergin.

Harry Y., aged 7, came with the history that 2½ years ago a sty formed on the right upper lid and 18 months ago the right lids received a blow from the handle of a perambulator. The case was first seen in January, 1909, when each eyelid was swollen but not cedematous; one piece of the lid was removed and examined but was found to be natural, the other piece was described as being of a tuberculous nature.

An Unusual Elastic Adhesion between the Cornea and the Iris.—Mr. Herbert Bell.

This was considered to be congenital in origin.

Pemphigus of Conjunctiva.—Mr. Blair.

The patient applied for treatment two months ago, with an attack of apparently mucopurulent catarrh and some thickening of the palpebral conjunctiva. At the present time there is essential shrinking of the conjunctiva. The treatment adopted was arsenic and fibrolysin.

PAPERS.

(a) *A Family with Congenital Displacement of the Lenses.*—Mr. P. H. Adams.

This family consisted of a mother and nine children, seven of whom were affected; all other branches of the family being quite free.

The first child, a boy, was seen in 1896 by Mr. Doyne, who noticed that the right lens was displaced downwards while the left was completely displaced. The second, a girl of 16, had her right lens displaced inwards, while the position of the left was up and in; the third, a girl, aged 14, had normal lenses. The fourth, a girl aged 12, had both lenses displaced downwards; the fifth, a girl, aged 11, had both lenses normal; the sixth, a girl aged 10, had both lenses dislocated inwards; the seventh, a boy aged 8, showed the right lens displaced upwards, and the left upwards and outwards; the eighth, a girl aged 3, had the left lens dislocated inwards and the right downwards. The ninth child, a girl aged 17 months, had both lenses displaced upwards.

It is interesting to notice the number of displacements upwards and in some cases downwards, whereas the usual position is upwards.

A colored drawing accompanied the paper.

(b) *A Family with Congenital Opacities of Lenses.*—Mr. P. H. Adams.

This family showed hereditary stellate cataract, the opacities outlining the sectors of the lens on the posterior surface, and in some cases the anterior surface though to a much less extent.

The eldest member of the family was the great-grandfather, aged 83, and in him the changes in the lens seemed to progress chiefly in the anterior part, as though it had spread from the original Y-shaped mark. The father and two sisters exhibited the same defect, and the daughter's two children were both affected; the son showed Y-shaped markings on the anterior surface of both lenses. The eldest girl showed posterior lines very sharply marked; the second child had normal eyes, the third, a boy aged 5, showed primary rings, and the youngest child, aged 7 months, had an inverted Y on the posterior surface of both lenses. The father, now 36, showed posterior lines; and none of the children had perfectly transparent lenses.

Reference was made to former similar cases.

[TO BE CONTINUED.]